

What is claimed is:

1. An impedance matching structure for a RF MEMS switch having at least one closeable RF contact in a RF line, the impedance matching structure including at least one protuberance or hump in the RF line immediately adjacent the at least one RF contact.
2. The impedance matching structure of claim 1 wherein the at least one protuberance or hump includes a tapered region extending from a relatively narrow portion of the RF line to a relatively wide portion of the RF line, the relatively narrow portion providing a means for conducting RF energy to and/or from the at least one RF contact of the RF MEMS switch.
3. The impedance matching structure of claim 2 further including another tapered region extending from the relatively wide portion of the RF line to a relatively narrow portion of the RF line immediately adjacent the at least one RF contact.
4. The impedance matching structure of claim 2 wherein the relatively wide portion of the RF line is at least twice as wide as the relatively narrow portion of the RF line.
5. The impedance matching structure of claim 2 wherein the relatively wide portion of the RF line is at least five times as wide as the width of the RF contact where the RF contact meets the RF line.
6. The impedance matching structure of claim 2 wherein the MEMS switch has an elongate moveable member for carrying RF energy, the relatively wide portion of the RF line being at least five times as wide as the width of the elongate moveable member.
7. The impedance matching structure of claim 1 wherein the RF MEMS switch is formed on a substrate and wherein the closeable contact is associated with an elongate moveable member having first and second ends, the first end being attached to the substrate and the second end being moveable to and from the substrate for closing the switch at said closeable contact and wherein the impedance matching structure further includes a protuberance in the RF line immediately adjacent a point where the first end of the elongate moveable member is attached to said substrate.
8. The impedance matching structure of claim 1 wherein the impedance matching structure has a boundary extending away from the RF line, the boundary being defined by a series of

straight lines.

9. A RF MEMS switch having two RF contacts disposed on a substrate, the substrate having a ground plane, and a RF conductor for coupling RF energy via the two RF contacts and wherein  
5 each of the two RF contacts has an associated protuberance or hump in the RF conductor immediately adjacent thereto.

10. The RF MEMS switch of claim 9 wherein the protuberances or humps in the RF conductor are disposed on the substrate and cooperate with said ground plane to form a  
10 capacitive element for impedance matching purposes.

11. The RF MEMS switch of claim 10 wherein at least a portion of the RF conductor is disposed on the substrate as RF lines and wherein another portion of the RF conductor is provided by a moveable member of the MEMS switch, each RF line being coupled to an  
15 associated one of the RF contacts and the protuberance or hump associated with each RF contact occurring in an associated RF line where it connects the associated one of the RF contacts.

12. An impedance matching structure for a RF MEMS switch formed on a substrate, the switch having two closeable RF contacts, a first of the two closeable RF contacts being coupled  
20 to a first RF line disposed on the substrate and a second one of the two closeable RF contacts being coupled to a second RF line disposed on the substrate, and an elongate moveable bar for closing a circuit between the two closeable RF contacts, the impedance matching structure comprising a first protuberance disposed on the substrate in the first RF line immediately adjacent the first one of the two closeable RF contacts and a second protuberance disposed on the  
25 substrate in the second RF line immediately adjacent the second one of the two closeable RF contacts.

13. The impedance matching structure of claim 12 including tapered regions extending from a relatively narrow portion of the first and second RF lines to relatively wide portions of the  
30 corresponding first and second protuberances.

14. The impedance matching structure of claim 13 further including additional tapered regions extending from the relatively wide portions of the first and second RF lines to relatively narrow portions immediately adjacent the corresponding first and second RF contacts.

35 15. The impedance matching structure of claim 13 wherein the relatively wide portions of

each of the first and second protuberances are at least twice as wide as the relatively narrow portions of the corresponding first and second RF lines.

16. The impedance matching structure of claim 13 wherein the relatively wide portions of each of the first and second protuberances are at least five times as wide as the width of the corresponding first and second RF contacts where the RF contacts meet the corresponding first and second RF lines.

17. The impedance matching structure of claim 13 wherein the relatively wide portions of each of the first and second protuberances are at least five times as wide as the width of the elongate moveable bar.

18. The impedance matching structure of claim 13 wherein the first protuberance has a boundary extending away from the first RF line and the second protuberance has a boundary extending away from the second RF line, the boundaries of the first and second protuberances each being defined by a series of straight lines.

19. A method of increasing the return loss of a MEMS switch to a level greater than 20 dB comprising:

- a. providing a MEMS switch arranged on a substrate and whose reactance is inductive; and
- b. adding at least one capacitor on said substrate, said at least one capacitor having two elements, a first element of said at least one capacitor being formed by a protuberance formed in a RF line disposed on said substrate immediately adjacent to a RF switch contact on the substrate, and a second element of said at least one capacitor being provided by a ground plane associated with the MEMS switch.

20. The method of claim 19 wherein said protuberance projects in a direction away from its associated RF contact.

21. The method of claim 19 wherein said protuberance has a boundary defined by a plurality of straight lines, at least one of said straight lines being disposed at an angle other than 0° or 90° relative to an edge of the RF line immediately adjacent the protuberance.

22. An impedance matching structure for a MEMS switch having at least one closeable switch contacting bar, the switch contacting bar when actuated, closing the MEMS switch by

making contact with contact pads disposed on a switch substrate, the impedance matching structure including a pair of protuberances or humps in signal lines coupled to said contact pads, the pair of protuberances or humps forming a  $\pi$ -network impedance matching circuit with the switch contacting bar.

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23. The impedance matching structure of claim 22 wherein each protuberance or hump includes a tapered region extending from a relatively narrow portion of an associated signal line to a relatively wide portion of the associated signal line, the relatively narrow portion providing a means for conducting signals to and/or from the MEMS switch.

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24. The impedance matching structure of claim 23 further including another tapered region extending from the relatively wide portion of the associated signal line to a relatively narrow portion of the associated signal line immediately adjacent an associated contact pad.